

Number TG 3211/  
3212

# MINILOADER

## THEORY GUIDE

TG I - 3211/3212

Miniloaders with Serial Numbers  
before 1125 and 1126



**KODAK LIMITED**

October 1989

THEORY GUIDE  
**NORMAL SEQUENCE**

Inserting a CASSETTE with the LATCH first and uppermost interrupts PHOTOCELL FC2. With the machine in the home position, MICROSWITCH MS1 is energized. The interruption of FC2 energizes the CONVEYOR BELT-MOTOR forward.

The CONVEYOR BELT carries the CASSETTE to the END STOP where it is detected by FC1 receiving a signal from the REFLECTIVE PATCH on the CASSETTE LID.

The signal from FC1 stops the CONVEYOR BELT MOTOR forward with the CASSETTE in position at the END STOP. The FC1 signal also starts the CAM MOTOR forward.

The CAM forward motion starts the CASSETTE opening cycle. The CLAW releases the CASSETTE LATCH and lifts the LID. MICROSWITCH MS5 operates to check that FC3 has been interrupted by the CASSETTE LID. FC3 indicates that the CASSETTE has opened. MS3 operates to check the REFLECTOR PATCH on the UPPER SCREEN to check that a film is not stuck to it. If a FILM is stuck to the UPPER SCREEN, the CAM is stopped until TIMER T3 times out, during which period air is injected in pulses to release it. This enables it to drop into its correct position on the LOWER SCREEN.

The CAMS continue to rotate bringing the CASSETTE and MAGAZINE SUCKERS down onto the exposed and unexposed films. MICROSWITCH MS2 operates to stop the CAM MOTOR and start TIMERS T4 and T2. TIMER T4 provides time to pick up the exposed and unexposed FILMS and when it times out after 1 second it starts the WHITNEY TILT MECHANISM which rotates the SUCKERS into the tilt position to separate the FILM. MS14 de-energises the MOTOR with the SUCKERS in the tilt position. TIMER T2 controls the tilt time between 0 and 7 seconds (adjustable) to allow time for the FILMS to separate. TIMER T2 times out and restarts the CAM MOTOR forward.

MICROSWITCH MS8 operates to check FC7 to see if a FILM is jammed in the CHUTE - or - the EXPOSED FILM MAGAZINE, according to which model it is. If a FILM is jammed or the MAGAZINE is full the vacuum will be turned off to prevent the EXPOSED FILM being picked up

MICROSWITCH MS4 operates to energize the WHITNEY MOTOR to remove the tilt. MS13 and MS15 de-energize the WHITNEY MOTOR with the SUCKERS in the horizontal position. MICROSWITCH MS7 operates to check FC1 to see that the EXPOSED FILM has been picked up from the CASSETTE.

The CAM MOTOR continues to rotate carrying the FILMS to their respective destinations. MICROSWITCH MS6 operates to de-energize the SOLENOID VALVES and VACUUM PUMPS to release the exposed and unexposed FILMS into the MAGAZINE or CHUTE and CASSETTE respectively.

MS16 operates to check that PHOTOCELL FC1 has detected that an unexposed FILM has been placed in the CASSETTE correctly. The CAMS complete the cycle and energize **MS1**.

The CONVEYOR BELT is energized in reverse and the cassette is ejected. The CASSETTE interrupts FC2 on the way out which energizes TIMER T6. TIMER T6 times out to de-energize the CONVEYOR BELT and complete the cycle.

## **Machines with serial Numbers before 1125 and No.1126**

When the cams are in the home position MICROSWITCH MS1 (32) is closed

At power up FC2 (30),TIMER T12 (33) and "POWER ON" LAMP (37) [ via MS9,MS10, MS11 AND MS12 ] are energised.

MICROSWITCH MS-1 (32) energises RELAYS KR1 (32) KR1A (34) and KR1B (35)

KR1-1 (36) enables KRM (36).

Timer T12 times out to give electronics time warm up and KT12-1 (36) enables Relay KRM.

KR1B-2 (79) enables CAM reset control.

KR1A-1 opens to (87) inhibit CAM RELAY KC (87).

KR1-2 (43) enables KN, KNA and "CASSETTE ENTRY" LAMP (41-45).

When the operator feeds a cassette:

PHOTOCELL FC2 (30) is interrupted by the CASSETTE and KFC2-1 (36) energises RELAY KRM (36).

KRM1-1 (37) holds RELAY KRM (36).

KRM-2 (41) completes the -12 volts line and energises PHOTOCELLS FC1, FC3, FC4, FC5, FC6, FC7 and FC8.

RELAYS KM1 (144),KS (151) and TIMER T7 (145)

RELAYS KN, KNA and CASSETTE ENTERED LAMP (42 to 45)

CONTACTS KS-1 (54) and KS-2 (80) inhibit BELT RETURN and RESET

KM1-1 (5) energises the COMPRESSOR.

TIMER T7 (145) times out after 1sec and KT7-1 and KT7-2 (104-71) energises SOLENOID VALVES S1 and S2 closed.

KN-1 (15) energises CONVEYOR BELT FORWARD and carries the CASSETTE to the END STOP.

When the CASSETTE arrives at the END STOP it interrupts PHOTOCELL FC1.

PHOTOCELL FC1 (146) sees the reflective patch on the LID of the CASSETTE and energises RELAY KFC1

KFC1-1 (52) energises RELAYS KFC1A,KFC1B,KFC1C and KFC1D (51-54). KFC1A-1 (53) self holds RELAYS KFC1A etc;

KFC1A-2 (43) de-energises RELAYS KN, KNA, and LAMP (42-45)

KN-1 (15) de-energises CONVEYOR BELT FORWARD.

KFC1B-1 (88) energises TIMER T10 (90) and enables RELAYS KC and KCA and TIMER T9 (87-89).

TIMER T10 times out after 1 sec to allow time for conveyor to stop before CAM is energised.

KT10-1 (89) energises RELAYS KC and KCA and TIMER T9 (87-89 ).

KC1 (19) energises CAM MOTOR FORWARD.

KCA-2 (87) enables self hold of RELAYS KC, KCA and TIMER T9. MICROSWITCH MS1 operates and de-energises RELAYS KR-1, etc.

KR1A-1 (87) closes to maintain RELAY KC, etc energised after TIMER T3 has operated later in the cycle.

The CLAW opens the CASSETTE LID which interrupts PHOTOCELL FC3 PHOTOCELL FC-3 (147) energises RELAY KFC3

KFC3-1 (96) energises RELAY KFC3A (96)

## **Miniloaders with Serial Numbers before 1125 and 1126**

## **NORMAL CYCLE (contd.)**

KFC3A-2 (97) self holds RELAY KFC3A (96).

MICROSWITCH S5 (62) operates to check if CASSETTE LID has opened.

On a normal cycle the lid opens and KFC3A-1 (62) inhibits RELAYS KRX and KRXA (62-63).

The opening cycle continues and MICROSWITCH MS3 (99) operates and energises RELAYS KR3, KR3A AND KR3B.

KR3A-1 (98) self holds RELAYS KR3 etc. KR3-1 (87) and KR3-2 (88) open to stop CAM.

KR3-1 (43) inhibits CONVEYOR forward.

MICROSWITCH MS8 operates to check FC7 to see if there is a FILM jammed in the CHUTE - or - the EXPOSED FILM MAGAZINE is full, according to which version machine it is. On a normal cycle FC7 will see its REFLECTIVE PATCH and inhibit RELAYS KFC7 and KFC7A (133 - 134).

PHOTOCELL FC4 CHECKS to see if a FILM is on the UPPER SCREEN PHOTOCELL FC4 looks at the REFLECTIVE PATCH on the UPPER SCREEN and with no FILM present on a normal cycle it will see the REFLECTIVE PATCH and Energises RELAY KFC4.

KFC4-1 (94) energises RELAYS KFC4A and KFC4B (95).

KFC4A-1 (95) self holds RELAY KFC4A.

KFC4A-2 (99) energises RELAY KR5 through KAOT-1 and LINK S22.

KR5-1 (100) changes over to self hold RELAY KR-5 (100) and inhibit RELAY KL and TIMER T3 which prevents the injector cycle operating on a normal cycle.

KR5-2 (105) energises RELAY KT3A.

KT3A-1 (106) self holds RELAY KT3A..

KT3A-2 (88) maintains the CAM in motion.

MICROSWITCH MS2 (73) operates and energises KR2, KR2A,KR2B,KR2C,KR2D and TIMERS T2 and T4(73-79).and SOLENOID L2 for injection.

KR2A-1 (74) self holds RELAYS KR2 etc;

KR2A-2 (87) deenergises RELAY KC.

KC-1 (19) deenergises the CAM MOTOR to stop the cycle with the CASSETTE and MAGAZINE SUCKERS in contact with the exposed and unexposed FILM in the CASSETTE and MAGAZINE respectively.

Vacuum is applied to pick up the respective FILMS when;

KR2C-2 (119) energises RELAYS KPC and KM2 and SOLENOID VALVE 53 (119-121).

KR2C-1(122) energises RELAYS KPM and KM3 and SOLENOID VALVE S4(122-124).

KM-2 (6) energises the CASSETTE VACUUM PUMP M2 (6).

KM-3 (7) energises the MAGAZINE VACUUM PUMP M3 (7)

KPM-1 (124) self holds RELAYS KPM and KM3 and SOLENOID VALVE S4 closed.

KPC-1 (121) self holds RELAYS KPC and KM2 and SOLENOID VALVE S3 closed.

TIMER T4 times out after 1 sec to allow time for the vacuum to build up to pick up the FILMS.

KT4-1 (71) energises RELAY KW (71) via MS141

KW-1 (13) and KW-2 (13) energise the WHITNEY TILT MOTOR M5 (13) into the tilt position where it is stopped by MS14 (71) opening.

TIMER T2 times out after 2 secs and KT2-1(86) energises RELAY KC (87).

KC-1(19) energises the CAM MOTOR M7 (23) FORWARD.

## **NORMAL CYCLE (contd.)**

MICROSWITCH MS-4 (66) operates and energises RELAYS KR4 and KR4A(66-70).

KR4-2 (70) energises RELAY KW

KR4-1 (70) closes to maintain circuit to RELAY KW (71) via MS13 (70).KW-1 and KW-2 (13) energise WHITNEY TILT MOTOR M5 to remove the tilt which is then stopped by MS13 (70) opening.MICROSWITCH MS7 (92) operates to check that the EXPOSED FILM has been picked up from the CASSETTE.

KFC1C-2 (92) remains open on a normal cycle and inhibits RELAYS KR7 and KR7A and TIMER T8 (92-94).

The transport mechanism carries the FILMS to their respective destinations

MICROSWITCH MS6 (118) operates and energises RELAY KR6 (118).

KR6-1 (119) deenergises RELAYS KM2, KM3, KPC and KPM and SOLENOID VALVES S3 and S4 open (119-124).

KM2-1 and KM3-1(6-7) de-energise the VACUUM PUMPS.

SOLENOID VALVES S3 and S4 vent the vacuum and the FILMS are released.

The exposed FILM is dropped into the RECEIVING MAGAZINE or CHUTE according to which model it is.

The UNEXPOSED FILM is dropped into the CASSETTE.

The CAM CYCLE is completed and MS1 is energised.

MS1 (32) energises RELAYS KR1,KR1A and KR1B(32-35)

KR1A-1 (87) de- energises RELAY KC, etc.

KC-1 (19) de-energises the CAM MOTOR M7.

RELAY KD (64) remains de-energised therefore KD-1 (21) short circuits CAM MOTOR M7 (22) windings to brake the motor.

KR1B-1 (58) energises RELAYS KNR, KNRA, KNRC. and KNRD(56-60)

KNR-1 (17) energises the CONVEYOR BELT REVERSE to carry the CASSETTE back out of the MACHINE

KNRB -1 (56) self holds RELAYS KNR etc;

KNRA-2 (64) enables RELAY KA (65).

The returning CASSETTE interrupts PHOTOCCELL FC2 and energises RELAY KFC2

KFC2-2 (64) closes to energise RELAY KA (64)

KA-1 (65) self holds RELAY KA KA-2 (60) energises TIMER T6 (60).

T6 times out and opens contact KT6-1 (36) which de-energises RELAY KRM

KRM-2 (41) contact opens to break the - ve line to complete the cycle.

## START SERIAL UNLOADING

Pressing the START SERIAL UNLOADING BUTTON S18 energises RELAYS KAOT and KAOTI (115-116). KAOT-1 (116) [or KNRD-1 (117) following a failure to load or unload cycle] self holds RELAYS KAOT and KAOTA.

KAOT-2 (99) inhibits RELAY KR-5.

The machine continues the normal cycle of operations after entering the cassette until MS 3 operates.

MS-3 energises RELAYS KR-3, KR3A, KR3B, TIMER T3, RELAY KT3A (via diode) and ON / OFF TIMING RELAY KL (97-1 05).

KR3-1 and KR3-2 (87-88) de-energise RELAYS KC (87) and KCA (89)

KC-1 (19) stops the CAM to allow time for the preceding film to clear the PROCESSOR ENTRY ROLLERS.

TIMER T3 times out and energises RELAY KT3A (105). KT3A-1 self holds RELAY KTA.

KT3A-2 (88) energises RELAY KC to re-start the CAM.

The normal cycle resumes until the CAM reaches the zero position and MS-1 energises the KNR RELAYS through KR1 B-1 (58).

KNRB-1 (56) self holds KNR, etc and energises TIMER T6 via KAOT-1. The CONVEYOR reverses and carries the CASSETTE out.

TIMER T6 times out as the CASSETTE is passing through PHOTOCELL FC2.

KT6-1 (36) opening ends the cycle but it is immediately re-started because the CASSETTE is interrupting PHOTOCELL FC-2.

After the last FILM has been unloaded from the cassette PHOTOCELL FC will detect the CASSETTE is empty on the next cycle.

MS7 checks PHOTOCELL FC-1, KFC1 C-2 (92) remains closed and energises RELAYS KR7, KR7A and TIMER T8 (92-94).

KR7-2 (112) energises RELAY KF2.

KF2-2 (116) contact opens to de-energise RELAYS KAOT and KAOTA. and end the SERIAL UNLOAD cycles.

## STOP SERIAL UNLOADING

Pressing the STOP SERIAL UNLOADING BUTTON energises RELAY KG (138)

KG-1 (116) deenergises RELAYS KAOT and KAOTI (115-116) to allow the machine to return to a normal cycle.

## CASSETTE EJECT

The CASSETTE RETURN BUTTON (54) is inhibited during a normal cycle by KS-1 (54) and can only be used when RELAY KRM is de-energised.

To eject a CASSETTE press BELT RETURN BUTTON 521 (54) which energises KNRE, the 4700 mF CAPACITOR, RELAY KNR and "CASSETTE EJECT" LAMP (53 to 56).

The DIODE (56) inhibits RELAYS KNRA etc.

KNR-1 (17) energises the CONVEYOR BELT REVERSE until the CAPACITOR discharges de-energising RELAYS KNRE, KNR and the "CASSETTE EJECT" LAMP after approx. 2 secs.

KNR -1 de-energises the CONVEYOR BELT MOTOR in reverse to stop the CONVEYOR BELT and complete the cycle.

## INCORRECT FEEDING OF CASSETTE

If the CASSETTE is entered incorrectly, PHOTOCELL FC1 does not see the REFLECTOR on top of the CASSETTE and does not energise RELAY KFC1.

KFC1-1 (52) remains open and leaves RELAYS KFC1A, KFC1B, KFC1C, and KFC1D de-energised (51-54).

KFC1 A-2 (43) remains closed keeping TIMER T1 and "CASSETTE ENTERED INCORRECTLY" LAMP energised.

TIMER T1 times out after 4 secs.

KT1-1 (43) de-energises RELAYS KN, KNA, KNB and "CASSETTE ENTERED" LAMP (41-45).

KN-1 (15) de-energises the CONVEYOR BELT MOTOR M6 forward.

KT1-2 (59) energises the CONVEYOR BELT MOTOR M6 in reverse.

The normal cycle continues until completion.

## DOUBLE THICKNESS ALARM

The normal cycle commences energising FC8 and CONVEYOR forward.

CONTACT KNA-2 (139) opens to inhibit RELAY KFC8.

A DOUBLE FILM will take PIN 13 of PHOTOCELL FC8 CHIP TCA 965 LO energising RELAYS KFC8 and KR and TIMER T11.

KFC8-1 self-holds KFC8 and LAMP ON in the MEMORY LINE.

KFC8-2 (139) inhibits RELAY KFC8 (KNA-2 has closed when CONVEYOR FORWARD stopped).

KR-1 self-holds RELAY KR and TIMER T11.

KT11-1 de-energises BUZZER when T11 times out.

## CASSETTE ENTERED EMPTY

The normal cycle continues until MICROSWITCH MS2 operates.

MS2 energises the KR2 RELAYS.

KR2D-1 (109) enables RELAY KF2, "FILM NOT REMOVED FROM THE CASSETTE" LAMP and ALARM BUZZER.

PHOTOCELL FC1 sees the REFLECTIVE PATCH in the bottom of the cassette because there is no FILM present.

KFC1D-1 (109) energises RELAY KF1 LAMP (108-109) TIMER T11 and RELAY KR (141-142).

KF1-1 (110) self holds RELAY KF1 and LAMP via KNA-1 (108) and the memory circuit.

KR-1 (142) self holds TIMER T11 and RELAY KR energised.

KT11-1 (143) energises BUZZER until. TIMER T11 times out and opens KT11-1.

**Miniloaders with Serial Numbers before 1125 and 1126**

## CASSETTE ENTERED EMPTY (cont.)

KFC1D-1 (119) remains open to prevent CASSETTE vacuum sucking the bottom of the CASSETTE. The normal cycle is continued and the CASSETTE is loaded with a new FILM.

The "CASSETTE FAILED TO LOAD" LAMP remains on in the MEMORY circuit until the next cycle energises the CONVEYOR BELT forward and KNA-I (IO8) opens to cancel it.

### CASSETTE FAILED TO OPEN

MS5 (62) operates to check if PHOTOCELL FC3 has seen that the CASSETTE has opened

If the CASSETTE failed to open PHOTOCELL FC3 will not energise RELAY KFC3

KFC3-1 (96) remains open therefore RELAYS KFC3A remains de-energised.

KFC3A-1 (62) energises RELAYS KRX, KRXA, and KD (62-64).

KD-1 opens to remove brake from CAM MOTOR M7.

KR-1 (61) energises TIMER T5 to allow enough time for the CASSETTE OPENING CLAW to clear CASSETTE LATCH with the CAM running in **reverse before the CONVEYOR starts in reverse.**

KRX-2 (63) self holds RELAYS KRX and KRXA.

KRXA-2 (91) energises RELAY KCR.

KRXA-1 (87) opens to stop CAM MOTOR forward.

KCR-1 (22) energises CAM MOTOR M7 in reverse until it reaches MS-1

TIMER T5 times out after 1 sec

KT5-1 (60) energises RELAYS KNR, KNRA, KNRC and KNRD.

The normal cycle continues to completion.

### RESET

The RESET BUTTON is inhibited during a normal cycle by KS-2 (80) and can only be operated when RELAY KRM is de-energised.

Pressing RESET (80) energises RELAY KB, RESET LAMP and RELAY KC through the DIODE (80-87).

KB-1 9380 OPENS TO INHIBIT KRM.

KB-2 (79) self holds RELAY KB.

KC-I (19) energises CAM MOTOR back to home position.

Energises MICROSWITCH MS-I and RELAY KR1.

KR1 B-2 (79) opens to de-energise CAM MOTOR.

### EXPOSED FILM ON UPPER SCREEN

MS3 checks for FILM on the UPPER SCREEN.

M53 energises RELAYS KR3, KR3A and KR3B.

KR3-1 and KR3-2 (87-88) de-energise RELAY KC.

KC-I (19) de-energises CAM MOTOR M7.

PHOTOCELL FC4 does not see the UPPER SCREEN REFLECTOR because it is covered by the FILM stuck to the UPPER SCREEN.

PHOTOCELL FC4 does not energise RELAY KFC4.

KFC4-1 (95) remains closed energising RELAYS KFC4A AND KFC4B (95).

KFC4A-1 (95) self holds RELAYS KFC4A, etc.

KFC4-2 (99) remains open leaving RELAY KR5 de-energised.

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## EXPOSED FILM ON UPPER SCREEN (contd.)

KR5-1 (101) energises RELAYS KL and TIMER T3.

Air is injected in pulses controlled by the ON / OFF TIMER CIRCUIT KI which energises SOLENOID VALVE SI open and closed through contact KL11 (103) to release the FILM from the UPPER SCREEN during the timing of T3.

Because the FILM failed to drop into its correct place in the cassette so that it could be unloaded

KFC4A-2 (122) de-energises SOLENOID VALVE 54 to drop the UNEXPOSED FILM back into the

MAGAZINE. TIMER T3 times out after 6 secs and energises RELAY KT3A (105). KT3A-2 (88) energises RELAY KC.

KC1 (19) energises CAM MOTOR FORWARD.

The normal cycle resumes to completion.

## MAGAZINE NEARLY EMPTY

PHOTOCELL FC5 detects MAGAZINE NEARLY EMPTY.

FC5 energises RELAY KFC5 (128)

KFC5-1 (128) self holds RELAY KFC5, and energises "MAGAZINE NEARLY EMPTY" LAMP, RELAY KR and TIMER T11

KR-1 self holds KR and TIMER T11

KNA-1 (108) holds LAMP on in the memory until the next cycle.

KT11-1 energises BUZZER for the duration of TIMER T11

## MAGAZINE EMPTY

PHOTOCELL FC-6 detects MAGAZINE empty.

FC-6 Energises RELAY KFC6 (130).

KFC6-2 (128) inhibits "MAGAZINE NEARLY EMPTY" LAMP.

KFC6-1 (131) self holds RELAY KFC6 and energises "MAGAZINE EMPTY" LAMP RELAY KR and TIMER T11

KR-1 self holds RELAY KR and TIMER T11

KNA-1 (108) holds LAMP on in the memory line until the next cycle.

KT11-1 energises the BUZZER for the duration of T11 TIMER.

## EXPOSED FILM MAGAZINE FULL or FILM JAMMED IN TUNNEL

PHOTOCELL FC-7 detects MAGAZINE FULL / FILM jammed in TUNNEL.

If the MAGAZINE is full or there is a FILM jammed in the TUNNEL then the PHOTOCELL will be blocked and energise RELAYS KFC7.

KFC7-2 (134) enables RELAY KFC7A.

MICROSWITCH M5-8 operates to check if the MAGAZINE is full or a FILM is jammed in the tunnel.

With a full MAGAZINE or FILM jammed in the TUNNEL RELAYS KFC7A, KR, TIMER T11 and LAMP are energised through KFC7-2.

KFC7A-1 (135) self holds RELAYS KFC7A and "MAGAZINE FULL" or "FILM JAMMED IN TUNNEL" LAMP on.

KR-1 self holds TIMER T11 and RELAY KR.

KFC7A-2 (119) prevents exposed FILM pick up from CASSETTE.

KT11-1 (143) keeps BUZZER energised for the duration of T11 TIMER. cycle.

**Miniloaders with Serial Numbers up to 1124 and No.1126**

## **FAILURE TO PICK UP EXPOSED FILM FROM CASSETTE**

**MS-7** operates to check if EXPOSED FILM has been picked up from the CASSETTE.

Because the FILM has remained in the CASSETTE, PHOTOCELL **FC1** cannot see the REFLECTIVE PATCH on the LOWER SCREEN. Therefore contact **KFC1C-1** remains closed .

**KFC1 D-I** (109) changes over and energises RELAY **KF1** and "FILM NOT REMOVED FROM CASSETTE" LAMP.

**KF1-1** self holds RELAY **KF1** and LAMP energised via **KNA-I** (108) memory circuit.

## **FAILURE TO PICK UP EXPOSED FILM FROM CASSETTE (contd.)**

**KF1-1** also energises TIMER **T11** and RELAY **KR**.

**KR1** (142) self holds TIMER **T11** and RELAY **KR** energised.

**KT11-1** (143) energises BUZZER until TIMER **T11** times out and opens **KT11-1**.

**MS7** (92) energises TIMER **T8** and RELAYS **KR7** and **KR7A** through **KFC1C-2** **KR7A-2** self holds RELAYS **KR7** and **KR7A**. **KR7-1** opens to de-energise RELAY **KC** (87) **KR7A-1** (122) opens to de-energise RELAYS **KPM** and **KM3** **KR7-2** (112) enables RELAY **KF2** and "CASSETTE NOT RELOADED" LAMP.

**KC11** (19) stops the CAM to enable the FILM to be dropped back into the MAGAZINE.

**KP1-1** de-energises SOLENOID VALVE to release vacuum to drop UNEXPOSED FILM back into the MAGAZINE.

**KM3-1** (7) de-energises the VACUUM PUMP

TIMER **T8** (92) times out after 1 second.

**T8-2** (94) self holds TIMER **T8** RELAY (92).







**KT8-1** (86) energises RELAY **KC**.

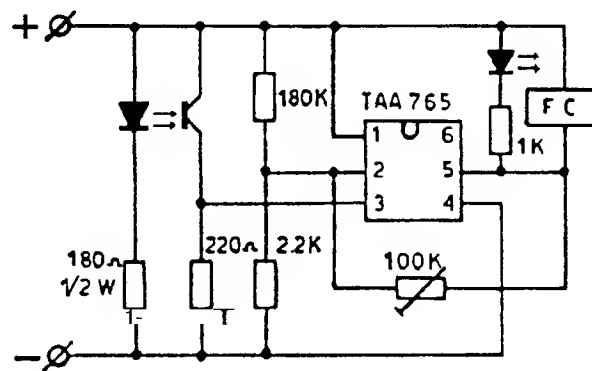
**KC-I** (19) restarts the CAM to complete the cycle.

At the end of the cycle **MS1 6** (112) operates to check if the CASSETTE has been reloaded and energises RELAY **KF2** and "CASSETTE NOT RELOADED LAMP" through **KR7-2S** (112-114)

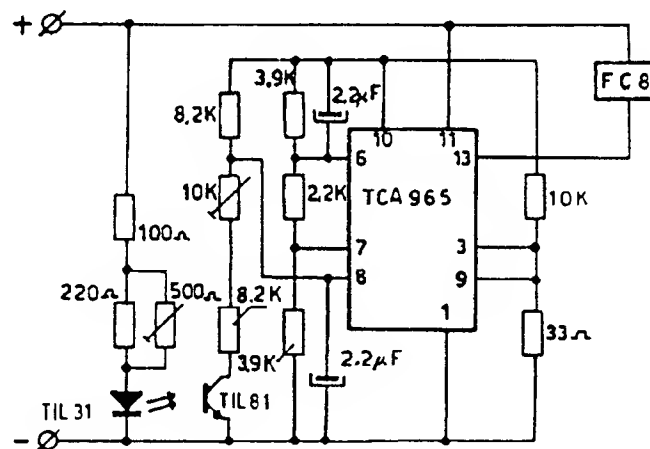
**Theory Guide**  
**Circuit Diagrams**  
**Serial Numbers up to 1124 and No.1126**

# LIST OF RELAY CONTACTS

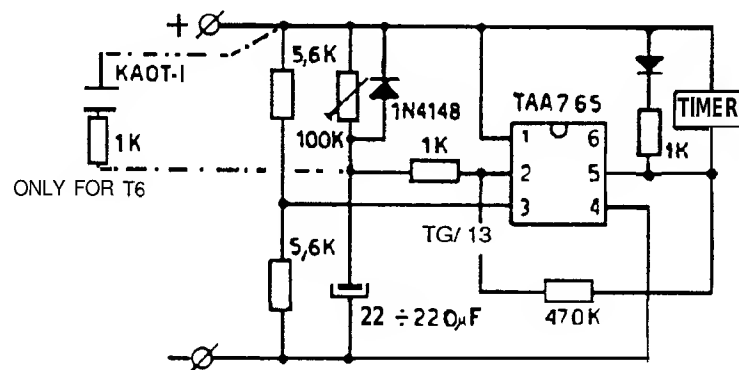
RELAY CONTACTS				RELAY CONTACTS			
RELAY				RELAY			
T12		36		KCA		87	58
KRI		36-43		T9		38	
KR1A		90 87		T10		89	91
KR1B		57 79		KCR		22-23	122-23
KRM		37 41		T8		86-94	
KN		15-16	15-16	KR7		112	87
KNA			108-I 39	KR7A		93	122
TI		59	43	KFC4A		95-I 22	
KFCID	108	111	119	KFC4B		103	
KFCIA		53	43	KFC3A		97	62
KFCIB		88		K3		87-88	
KFCIC		92		K3A		98	
KNR		17-18	17-18	K3B		43	
KNRA		64	36	KR5	100	105	101
KNRB		56		KL		103	
KNRC		125		T3		102	
KNRD		117		KT3A		83-I 06	
T6			36	KFI		110	116
T5		60		KF2		114	116
T5A		61A-150		KAOT		T6 TIMER	99
KRX		6I-63		KAOT1		116	
KRXA	87	91	43	KR6		119	
KD		2I		KPC		I2I	
KA		60-65		KM		6	
KR4		70-70		KPM		I24	
KR4A		108		KM3		7	
KW		13-I3	14-14	KSS		I26	122
KR2		58		FC5		128	
KR2A		74	87	FC6		131	128
KR2C		119-122		FC7		134	
KR2D		109		KFC7A		136	119
T2		86		KG		116	
T4		71		KFC8		140	116
KB		79	38	KMI		5	
KC		19-20 19-2I		T7		71-104	
FCI		52					
FC2		36-64					
FC3		96					
FC4		94-99					
FC8		116-139					
KFC8A		140					
KNRE		36					
TII		143					
KR		142					
KR3		88	87				
KR3A		98					
KR3B		43					
KS		54-80					



Photoamplifier



Double film detection



Timers

Auxilliary circui s  
Serial No.s up to

Socket on  
Mother Board

Socket on PCB 108  
(Photocell Board)

1-6  
2-3  
3-2  
4-7  
5-15  
6-8  
7-1  
8-13  
9-9  
10-  
11-  
12-12  
13-10  
14-4  
15-14

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3-2  
4-14  
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6-1  
7-4  
8-6  
9-9  
10-13  
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12-12  
13-8  
14-15  
15-14

15-way D-type  
Socket

15-way D-type  
Socket

Cable from PCB 108 to  
Mother Board Photocell Board

Socket at  
Display Panel End

Plug at  
Mother Board End

1-15  
2-22  
3-2  
4-4  
5-3  
6-10  
7-9  
8-16  
9-24  
10-5  
11-14  
12-25  
13-6  
14-23  
15-19  
16-1  
17-18  
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19-17  
20-13  
21-7  
22-12  
23-11  
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25-21

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7-21  
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9-7  
10-6  
11-23  
12-22  
13-20  
14-11  
15-1  
16-8  
17-19  
18-17  
19-15  
20-  
21-25  
22-2  
23-14  
24-9  
25-12

25-way D-type  
Socket

25-way D-type  
Socket

Cable from Display Panel to  
Mother Board

